Acta Biologica Szeged. *19* (1—4), pp. 213—237 (1973)

RECENT DATA ON THE ANTHROPOLOGY OF ONE OF THE POPULATIONS (VÉSZTŐ) OF THE HUNGARIAN GREAT PLAIN (ALFÖLD)

FARKAS, GY. and LIPTÁK, P.

Department of Anthropology, Attila József University, Szeged

(Received June 10, 1972)

Introduction

Under Turkish rule, the settlements of Békés county became partly or completely depopulated. Before the river Sebes Kőrös was controlled, the environment of Vésztő was characterized by the marshy landscape of the Kis-Sárrét; its resettling began in 1723, as a result of the activity of the Austrian János Harruckern. Harruckern followed the principle of settling a population of the same nationality and religion in each of the places earlier peopled. To Vésztő there went Hungarians of the reformed (Calvinist) religion, moving to their new residence mainly from Bihar and Hajdú counties in the eastern part of the Great Hungarian Plain (Alföld), and there also remigrated a large part of the population that had lived there earlier but made their escape from the Turkish occupation of the country. In this respect we refer partly to a geographical paper (PALOTÁS, A.: in the press.) and to a more detailed anthropological monograph (FARKAS—VARGA, in the press).

In addition to the investigation of the adult population, on the basis of the data of parish registers some notes were prepared by the authors as to the period between 1937—1970, as well. According to these, weddings took place mainly in the months of November and December, while in summer their number was very low. The frequency of births was highest in the month of September. 47,4 per cent of the deceased died due to diseases of the heart or circulatory disturbances. A wide range of cancerous diseases can be observed among the population. Most deaths occurred in March.

On the basis of the body measurements of 415 boys and 551 girls (body height, weight and normal chest measurement), the physical development of the 3—18 year old children at Vésztő can be described as good, even compared with the children in the large cities of Hungary. The menarche median of girls is 12.90 years, this does not fall behind the national value (BOTTYÁN *et al.*, 1963). The first menstrual bleeding occurred with the highest frequency in January.

Anthropological characterization of the adult population

The 903 adult individuals examined in March 1972 correspond to nearly 10% of the population. On the basis of the census data from 1970, the number of inhabitants was 9943 individuals (A. PALOTÁS, in the press). 77% of the persons measured, tracing their descent back to the grandparents, descended from families native to that place.

On the occasion of the anthropological investigations, the following measurements were determined: body height, trunk length, maximum head length, maximum head breadth, zygomatic breadth, morphological face height, angle breadth of the mandible, nasal height, nasal breadth (MARTIN–SALLER, 1957). The colours of hair and eyes too were established, on the basis of Saller's scale

of hair colours and Schultz's scale of eye colours. Finally, photographs of the persons were also made, in three norms (FARKAS–VARGA, in the press).

On the basis of the parameters calculated by the usual biometric methods the anthropological characterization of the adult population can be given as follows (Table 1 to 8).

Body height

The stature may be put, for both sexes, primarily in the lower categories. The low and small-medium stature occured for *males* (between 150–164 cm) in approximately 42%, and for *females* (between 140–153 cm) in about 47%. The frequency of those of large-medium and tall stature is for males (between 167–180 cm) approximately 35%, and for females (156–168 cm) about 32%.

The mean values of body height belong for males between 24–40 years of age to the large-medium group, and those between 41–60 years to the medium group. The average stature of the 24–40-year old females corresponds to the medium, and that of between 41–60 years of age to the small-medium body height.

The stature decreases with age. The difference in stature between the 16–23-year old individuals and those older than 61 years is 6.5 cm in the case of males, and 8.2 cm in the case of females.

Major measurements of the head

The maximum head length, for both sexes equally, is primarily medium, but the occurence of dolicho- and brachycephalic individuals is also considerable. On the basis of the maximum head breadth, in the case of both sexes, mainly the medium brachycephalic individuals are dominant, followed in frequency by the brachycephalic ones.

On the basis of the zygomatic breadth, the most frequent in the case of both sexes in the broad face, followed by the group of persons with medium broad faces. The ratio of broader faces is higher in females than in males. The morphological face height in both sexes, in approximately 90% of the examined persons, is established as low and medium high.

The most important indices

On the basis of the distribution of the *cephalic indices*, in both sexes, the brachy-, and hyperbrachycephalics are represented in 85–90%. The height-length index of the head shows a highly uniform picture in both sexes, nearly 100% of the examined persons belonging to the hypsicephalic group. According to the height-breadth index, there primarily metriocephaly occurs, but the number of acrocephalic individuals is considerable, too.

The values of the facial index indicate predominantly euryprosopy but a displacement can be observed in females mainly towards the lower, and in males towards the higher values. On the basis of the nasal index, the population is mainly leptorrhine, but mesorrhiny too is considerable.

Colour of eyes, colour of hair

The eyes of the males are generally of moderate pigmentation (light blue, light grey, greenish). Brown eyes could be observed in only 20% of the cases. In the case of the females, however, mainly shades of brown eye colours were found, in nearly 35%, and light blue and ash-blue eyes were extremely rare.

The hair, for both sexes, is mainly dark brown and black. Lighter brown hair too is considerable. Fair and red hair is very rare; it can be found in only a negligible proportion (in males 2.7%, and in females 5.4%).

On the basis of the two characteristics the joint occurence of black or dark brown hair and of greenish eyes is the most frequent for the males, and the combination of black or dark brown hair and greenish or brown eyes for females. The joint appearance of light hair and light blue eyes is in both sexes the most rarely.

Age differences

The difference of sature between males and females for the 24–60 year olds, but also for the older persons is almost uniformly 12 cm.

In males, after their 61st year of age, the length and contour of the head decrease. The mandibular angle breadth increases between 24 and 60 years as compared to the previous age-group, but after this it decreases and the mandible becomes narrower. The nasal breadth, like the nasal height, increases with the age. The facial height increases between 24–40 years, and then bocomes gradually lower. The same tendency can be observed in the facial index, too. That is to say, the face becomes lower not only in absolute measure but, at the same time, it becomes relatively broader, too.

The stature of the females, like that of the males, decreases with the age. The minimum frontal breadth does not change considerably in the individual age-groups. On the other hand, the angle breadth of the mandible increases more and more and the mandible becomes broader. The same refers to the nasal breadth, as well. The facial height increases somewhat between the years 24 to 40, and then begins to decrease.

As regards the other features, a considerable, constantly uniform difference cannot be demonstrated in any direction.

Measurement of variations

To establish the variability of the individual characteristics, we took Howell's „mean sigma" ratio as starting point. The formula underlying the calculation is: S. R. = 100. s/σ, which expresses the dispersion of the sample as a percentage of the dispersion considered as normal. The values obtained for the males are given in Table 9. The higher the value of S. R. above 100, the larger, the variation too, of course. It can be seen from the Table that the value of the ratio is lower than 100 only in the cases of the frontal and mandibular breadth, and for the other characteristics it is always higher. Even the average S. R. value for the seven absolute sizes exceeds 100. On this basis we may establish that for the given characteristics of the population investigated, a larger variation was found in the males than the average, indicating a moderately heterogeneous population.

Sexual dimorphism

The sexual dimorphism was extablished for absolute and relative dimensions on the basis of the sexual variance. It was determined with the previously applied formula (FARKAS–LIPTÁK, 1970). The sexual variance given in Table 10 for the absolute dimensions indicates that for the male and female individuals of the sample investigated a considerable sexual dimorphism was not found. The investigated population is in this respect fully similar to an earlier studied, similarly village population.

Taxonomic analysis

Taxonomic analysis is mainly of inportance in the investigation of paleoanthropological material (LIPTÁK, 1961). In an investigation of skeletal finds from the 7–13th centuries, the author cited gradually built up the important race-systematic places of human types and their somatologic characterization. These are as follows:

A B

Fig. 1

The characterization of the *Uralian* race, occurring mainly in the Ugrians, can be found in monographs on the Ostyaks (LIPTÁK, 1950), the Hungarian conquerors of the 10th century (LIPTÁK, 1954a), and the Ostyak population

Fig. 2

(*measured* by JÁNOS JANKÓ) that lived at the end of the last century (LIPTÁK, 1954b). The differentiation of the major *Europid races* was made in connection with the anthropological investigatin of the cemetery of the Hungarian common people from the 11th century, at Kérpuszta (LIPTÁK, 1953). The characterization of the *Turanids* and the verification of the existence of the Pamirian race among the anthropological components of the conquering Hungarians are contained in the same monograph, analysing mainly the taxonomic problems connected with the two races (LIPTÁK, 1955). The differential-diagnostic characterization of the Mongolid great race, and within this of the separate Mongolid taxons was published in connection with the Avars in Hungary (LIPTÁK, 1959). The anthroposystematics has been summarized on a number of occasions (LIPTÁK, 1962a; 1962 b; 1965; 1966; 1969).

On the basis of taxonomical standard works from 1955–1965, this could be applied, from the point of view of Hungarian ethnogenesis, to the paleoanthropological material.

The investigation of the populations living to-day from the taxonomic point of view is generally not such an important task. Nevertheless, it has some importance if, for example, we are looking for the continuity between – let us suppose – the present population and that in the Árpádian Age. This

A B

Fig. 3

historical continuity was often broken by historical processes of the inhabitants and demographical changes (transmigration, immigration, fluctuation in the number of the population, etc.). The territory of the Great Hungarian Plain is fundamentally important from the point of view of the settlement of the Hungarian population, but was exposed, unfortunately, to grave disasters like the invasion by the Tartars (1241–1242) and the Turkish rule for 150 years in Hungary after the defeat at Mohács (1526).

Another aim of taxonomic analysis is to enable the comparison of individual populations on the basis of some common principles – as a result of having separated them according to a certain point of view. The anthropological „type-spectra" of all peoples differ from one another, but even within one ethnic group some regional groups can be distinguished from each other. That is to say, the population of the Great Plain may show some differences, according to settlements of regions. Later on, we shall compare four settlements with that at Vésztő. It was mentioned in the Introduction that although the settlement at Vésztő belonged regionally to the area of the Great Plain at Nagysárrét, it developed from the adjacent settlements after the expulsion of the Turks. At the same time we can mention for comparison, that in Orosháza, for example, live Hungarians who migrated from the Transdanubian areas.

Let us now consider the anthropological make-up of the population investigated at Vésztő (Table 11).

A. The brachycephals of dark complexion are dominant (63%). Within these – and overall within the whole population – some 13% could not be diagnosed exactly (br). Among the brachycephalic anthropological components the Alpines (a) have the highest proportion. These are characterized by a rounded head and less strongly marked features, their stature being small-medium or medium. The profile of the nose is mostly concave. Good representatives of these are to be seen in Fig. 1 (pictures a and b). Very characteristic of this population is the Armenoid race (ar) that can be found in the conquering Hungarians, too. The nose is strongly protruding and curved, the tip of the nose tends somewhat downwards, and the front is sometimes curved; the so-called hawk nose is rather frequent. The stature is large-medium (Fig. 2). Very characteristic of the conquering Hungarians is the Pamirian race (p) originating from Middle Asia but with Europid features, such as the less protruding, somewhat curved nose and the flatness of the lambdoid region. In some cases there are added more or less Turanid features, as well (Fig. 3). In the population at Vésztő, particularly in the case of females, the fairly considerable proportion of the Lappid (l) race, called Protoalpine by some

A B

Fig. 4

anthropologist, was stirking. The Lappids are characterized by a low and and broad face, a definitely concave (snub) nose and a short stature. This feature is the most wide-spread among the Finno-Ugrians (Lapps) and it occurs in other regions of Eastern Europe, too, thus in Poland and the Ukraine (Fig. 4). Not numerous, but strongly marked representatives of the Dinaric (d) race could also be established. This human type is characterized by a large-medium or medium stature, flatness of the occiput (planoccipitalia) and a very strongly protruding, narrow, curved nose (Fig. 5).

Fig. 5

B. In this population the other human races appear in relatively not high proportions. Among them, however, the group of Cromagnoids with some 22% is outstanding; this name is due to their originating from the Upper-Palaeolithic Cro-Magnon race. Cromagnoid-A (crA) is the most reminiscent of this Upper Palaeolithic race. In the sample from Vésztő the participation of Cromagnoid-C (crC) is the most considerable (altogether some 10%), called also „Andronovo type" after a Bronze-Age site in Siberia. It is important to mention the „Andronovo race" – at least as a synonym – because this taxon is one of the components of the development of

Fig. 6

just the Turanid race of Europo-Mongolid character. In Hungary it presents itself generally in a non-depigmented form, its characteristic feature being a low, broad and oblong face (Fig. 6). In the earlier Hungarian anthropological

Fig. 7

literature there was no reference to the importance of this human type, this terminology not even being known at that time. Earlier a greater importance was attached to the type Cromagnoid-B (crB), or under a more well-known name, the East-Baltic or Eastern-Europid race, but its numerical proportion is not very considerable either in the present population or in that of the age of the Hungarian conquest. In the population of Vésztő, too, it means not more than some 8% (Fig. 7). It is characterized by a short or small-medium stature, a moderate brachycephaly, greyish eyes, pale fair hair and a concave noseprofile. It may have developed by hybridization. This race is otherwise characteristic of the Finns and of some Slavic peoples, too. Most reminiscent of the classical Cro-Magnon race is the Cromagnoid-A taxon. This can be proved, however, not more than about 4% of the population of Vésztő (iFg. 8). It differs from the Andronovo type mainly in that the head is longer and, according to the cephalic index, mesocephalic or, as a results of brachycephalisation, it is moderately brachycephalic.

Fig. 8

C. The Mediterranean race is also characteristic of the Hungarians, and it was characteristic in the age of the Hungarian conquest, too. This means altogether 13% of the population investigated at Vésztő. A somewhat higher numerical proportion than this points to the gracile Mediterranean (m) race (the male shown in picture „a" of Fig. 9), characterized by a dark complexion, and a small-medium or short stature. It is also characterized in a slightly lower proportion by the Atlanto-Mediterranean (am) taxon of taller stature (the female shown in picture „b" of Fig. 9).

A B

Fig. 9

D. Among the other elements of the population the very low numerical proportion of the dolichocephalic Nordics (n) of light complexion and tall stature is negligible. Much more important – having historic importance and indicative of the Hungarians of the age of conquest – are the individuals showing moderate Mongoloid features. In picture „a" of Fig. 10 the Ugrian origin of the Hungarians is represented by the female reminiscent of the Uralian race (u). In picture „b" of Fig. 10 we see a female similarly showing the features of the Europo-Mongolid Turanid (t) race and of the earlier-mentioned „andronovo type" of Europid character. This may have been called earlier the „race of the Great Plain" (Alföld type) by one of the prominent researchers of Hungarian ethnical anthropology, LAJOS BARTUCZ.

A B

Fig. 10

Comparison with other samples

We have compared the anthropological features of the population of Vésztő with other samples. In the comparison with various populations, a check was first made of the supposition of equal dispersions by the F-test. The 2% level was used, and where the hypothesis of equal dispersions had to be rejected at that level, the t-test was not performed. The calculated values are given on the basis of variance analysis in Tables 12 and 13, and on that of arithmetic means in Tables 14 and 15. For comparison we have used the samples of Tápé (FARKAS–LIPTÁK, 1970), Orosháza (FARKAS–LIPTÁK, 1965), Dömsöd (KELEMEN, 1968) and Szakmár (HENKEY, 1966). On the basis of our calculations the following can be established:

a. There is a major difference between the averages that can be proved statistically, too (at a 99% confidence level, with the value $t = 2{,}58$, $P < 1\%$) in the following cases.

Males: as compared with the males of Vésztő, the following measurements are larger: the maximum head breadth, the minimum frontal breadth, the zygomatic breadth, the morphological face height and the cephalic index of the males of Szakmár; the maximum head length and the zygomatic breadth of the males of Tápé; the stature of those of Orosháza; the minimum frontal

breadth and the transverse fronto-parietal index of those of Dömsöd; on the other hand, the cephalic indices of the males of Tápé and Orosháza are smaller than those of the males of Vésztő.

Females: as compared with females of Vésztő, the following measurements are larger: the angle breadth of the mandible, the face height and the stature of those of Orosháza; the minimum frontal breadth and the transverse fronto-parietal index of the females of Dömsöd; on the other hand, the angle-breadth of the mandible of the females at Vésztő is larger the than that of the females at Orosháza.

b. There is a statistically provable difference between the averages (at a 95% confidence level, with the value $t = 1.96$, $1\% < P < 5\%$) in the following cases.

Females: the maximum head length of the females of Szakmár is larger and the cephalic index of those of Tápé is smaller, as compared to the females of Vésztő.

c. In a great number of the cases the t-test could not be applied (these t-values are missing from the corresponding columns of Tables 14 and 15).

d. Finally, in the other cases no statistically provable difference ($P > 5\%$) can be demonstrated between the arithmetic means.

On the basis of all this, it seems that there is no difference from an anthropological point of view between the males and females of Vésztő and Dömsöd. The samples of Vésztő and Tápé are very close to each other, while in the case of the males and females of Vésztő and Orosháza, as well as in that of the females of Szakmár, owing to the different character of dispersions, the difference between the means cannot be evaluated statistically. This does not mean that these samples should be identical as the difference between the means cannot be proved. The problem is only that the possibly existing difference cannot be demonstrated on the basis of the arithmetic means. If there is really any difference between the samples mentioned in these cases, too, then it can be established only on the basis of the dispersions. For these investigations we would need the original data, and in addition, the problem could be solved only by performing Mann-Whitney's test (Hajtman, 1968), taking into consideration the large number of the elements of the samples. We can mention as an example the empirical dispersion curve of the cephalic index

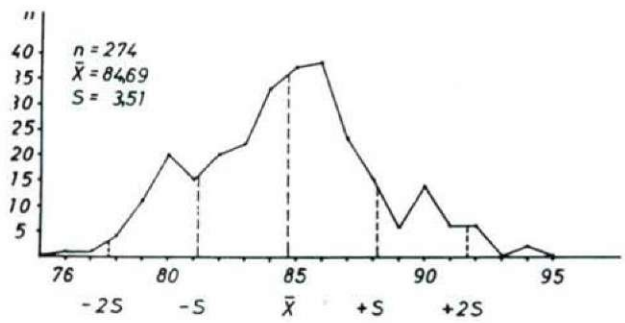

Fig. 11. Empirical distribution of the cephalic indices of 24—60-years old males

that, at least for males, is indicative of the presence of three components (Fig. 11), while for females (Fig. 12) it strongly approaches the Gaussian curve for normal dispersion. It is conceivalbe, therefore, that the very similar arithmetic means of the various samples refer to groups of entirely different composition.

We have carried out the comparison of populations on a taxonomic basis, as well. It meant some difficulty that, except for the samples of Orosháza,

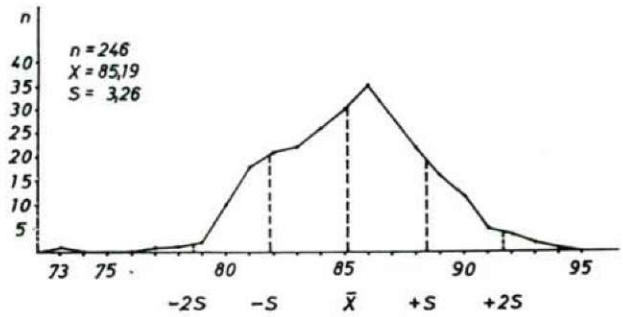

Fig. 12. Empirical distribution of the cephalic indices of 24—60-years old females

Tápé and Vésztő, detailed taxonomic tables had not been published; attention was drawn only to the most important components or the percentage of these were given. Our taxonomic comparison was therefore limited mainly to the three samples mentioned.

The result of this comparison is as follows: in the population of Orosháza (number of sample elements: 683) the brachycephalic individuals prevail (64%), after these, the Mediterranean ones have also a major share (23%). In the sample of Tápé (number of the sample elements: 686) the brachycephals similarly dominate, their percentage, however, being lower (45%), while the next most important component is not the Mediterranean but the Cromagnoid (34%). In the population of Vésztő the occurence of brachycephals is of approximately the same percentage as in the population of Orosháza, and the Cromagnoids appear with an even greater frequency (Table 11).

In the case of the three samples from the southern region of the Great Plain (total number of sample elements: 2107) the brachycephalic group occured in the most considerable proportion (58%), followed by the Cromagnoid (22%) and Mediterranean groups (17%). The frekuencies of the Nordic race (4%) and of the Mongoloid elements (1%) were negligible. Particularly the latter is remarkable, as according to GYULA HENKEY's investigations on the Danube-Tisza interstream region the occurence of the Europo-Mongolid (primarily Turanid) elements in some 40% is characteristic of the Hungarians. It might be admitted that in the area investigated by him (the Danube–Tisza interstream region) the frequency of these is higher than in other territories of the Great Plain. All the same, such a large difference must mainly be the result of taxonomic analysis by another method – as referred to by us already in an earlier paper (FARKAS–LIPTÁK, 1970).

References

BOTTYÁN, O.—DEZSŐ, GY.—EIBEN, O.—FARKAS, GY.—RAJKAI, T.—THOMA, Á.—VÉLI, GY. (1963): A menarche kora Magyarországon. (The age of menarche in Hungary). — Anthrop. Közl. *7*, 25—39.

FARKAS, Gy.—LIPTÁK, P. (1965): A lakosság embertani képe. In: Orosháza története és néprajza. (Anthropological picture of the population. A history and ethnography of Orosháza). Red.: Gyula Nagy. Orosháza. *2*. 344—399.

FARKAS, Gy.—LIPTÁK, P. (1970): Újabb adatok a magyarság etnikai embertanához. Tápé népességének anthropológiai vizsgálata. (Neuere Angaben zur ethnischen Anthropologie des Ungartums. Anthropologische Untersuchung der Population von Tápé). Anthrop. Közl. *14*, 35—70.

FARKAS, Gy.—VARGA, I. (in the press): Vésztő lakosságának antropológiai arculata. Vésztő nagyközség monográfiája. (Anthropological aspect of the population of Vésztő. — In: A monograph of the community Vésztő).

HAJTMAN, B. (1966): Bevezetés a matematikai statisztikába pszichológusok számára. (Introduction to mathematical statistics for psychologists). — Budapest. 348—352.

HENKEY, Gy. (1966): Szakmár felnőtt lakosságának embertani vizsgálata. (Anthropologische Untersuchung der Erwachsenen von Szakmár). In: „Szakmári honismereti értesítő". 35—55.

KELEMEN, A. (1968): Dömsöd, egy központi fekvésű község népességének embertani helye. (Dömsöd, position anthropologique d'une population centrale de la Hongrie). — Anthrop. Közl. *12*, 125—160.

LIPTÁK, P. (1950): Materialy po kraniologii Hantov (Étude anthropologique des crânes ostiaks). — Acta Ethn. Hung. *1*, 197—230.

LIPTÁK, P. (1953): L'analyse typologique de la population de Kérpuszta au Moyen Age. — Acta Arch. Hung. *3*, 303—370.

LIPTÁK, P. (1954a): An Anthropological Survey of Magyar Prehistory. — Acta Linguist. Hung. *4*, 133—170.

LIPTÁK, P. (1954b): JANKÓ JÁNOS vizsgálatai a Közép-Ob melléki chantik között. (J. JANKO's investigations among the Hantis along the Middle-Ob). — Nyelvtud. Közl. *56*, 97—116.

LIPTÁK, P. (1955): Zur Frage der anthropologischen Beziehungen zwischen dem Mittleren Donaubecken und Mittel-asien. — Acta Orient. Hung. *5*, 271—312.

LIPTÁK, P. (1959): The „Avar Period" Mongoloids in Hungary. — Acta Arch. Hung. *10*, 250—279.

LIPTÁK, P. (1961): On the problems of historical anthropology (palaeoanthropology). — Acta Biol. Szeged. *7*, 175—183.

LIPTÁK, P. (1962a): Embertan és emberszármazástan. (Anthropology and human origins). — Univ. lecture notes. Budapest.

LIPTÁK, P. (1962b): Homo sapiens — species collectiva. — Anthrop. Közl. *6*, 17—27.

LIPTÁK, P. (1965): On the taxonomic method in palaeoanthropology (historical anthropology). — Acta Biol. Szeged. *11*, 169—183.

LIPTÁK, P. (1966): Embertan és emberszármazástan. (Anthropology and human origins). — Uniform Univ. lecture notes. Budapest.

LIPTÁK, P. (1969): Embertan és emberszármazástan. (Anthropology and human origins). — — Univ. Textbook. Budapest. (2nd ed. 1971).

MARTIN, R.—SALLER, K. (1957): Lehrbuch der Anthropology. Stuttgart.

A. PALOTÁS, J. (in the press): Vésztő nagyközség gazdaságföldrajzi viszonyai. — In: Vésztő nagyközség monográfiája. (Economic geographic conditions of the community of Vésztő. — In: A monograph of the community of Vésztő).

Addresses of the authors:

Dr. GY. FARKAS

Prof. Dr. P. LIPTÁK

Department of Anthropology

A. J. University,

H — 6701 Szeged, P. O. Box 428

Hungary

Table 1. Major parameters of the measurements and indices of the 24—40-years old males

No.of measu-rement	Character	n	w	$\bar{x}$	m	s^2	s
1.	Maximum head length	90	176—202	186,95	0,62	34,32	5,85
3.	Maximum head breadth	90	146—176	158,57	0,58	31,02	5,56
4.	Minimum frontal breadth	90	100—121	108,31	0,44	17,54	4,18
6.	Bizygomatic breadth	91	133—162	142,72	0,49	22,23	4,71
8.	Mandibular angle breadth	91	102—128	111,00	0,55	27,66	5,25
13.	Nasal breadth	91	30— 41	35,25	0,24	5,44	2,33
15.	Head-ear height	91	119—145	131,72	0,60	33,10	5,75
18.	Morphological face height	91	106—140	121,33	0,74	50,06	7,07
21.	Nasal height	91	44— 62	52,91	0,36	12,16	3,48
45.	Horizontal head contour	91	500—595	562,61	1,71	67,34	16,35
1.	Body height	88	154,9—184,5	167,93	0,62	34,04	5,83
23.	Sitting height (trunk length)	91	81,0— 97,3	87,51	0,34	10,77	3,28
3:1	Cephalic index	89	77,7— 92,2	84,77	0,35	10,71	3,27
15:1	Heigh-length index	90	62,3— 80,7	70,70	0,38	10,71	3,64
15:3	Heigh-breadth index	90	75,5— 93,9	83,38	0,41	13,22	3,86
4:3	Transverse frontoparietal index	89	62,5— 75,8	68,59	0,31	8,59	2,93
18:6	Morphological facial index	91	72,9—102,1	85,16	0,58	30,74	5,54
8:6	Jugomandibular index	91	66,1— 87,4	77,73	0,36	11,58	3,40
13:21	Nasal index	91	50,0— 82,0	66,83	0,67	41,15	6,41

Table 2. Major parameters of the measurements and indices of the 24—40-year old females

No. of measu-rement	Character	n	w	$\bar{x}$	m	s^2	s
1.	Maximum head length	96	164—194	178,20	0,55	30,10	5,48
3.	Maximum head breadth	96	137—169	151,50	0,59	34,01	5,83
4.	Minimum frontal breadth	96	95—118	104,57	0,49	22,95	4,79
6.	Bizygomatic breadth	96	123—154	136,52	0,56	30,67	5,53
8.	Mandibular angle breadth	96	92—120	103,12	0,57	31,05	5,57
13.	Nasal breadth	96	26— 40	32,41	0,25	6,07	2,46
15.	Head-ear height	96	117—145	127,47	0,57	30,88	5,55
18.	Morphological face height	96	96—123	110,34	0,61	35,77	5,98
21.	Nasal height	96	42— 60	49,66	0,33	10,50	3,24
45.	Horizontal head contour	96	515—590	542,62	1,51	218,97	14,79
1.	Body height	95	141,7—168,7	155,61	0,56	30,33	5,50
23.	Sitting height (trunk length)	95	72,2— 91,2	82,71	0,34	11,35	3,36
3:1	Cephalic index	96	72,5— 93,4	85,03	0,34	11,48	3,38
15:1	Height-length index	96	65,1— 77,7	71,56	0,31	9,08	3,01
15:3	Height-breadth index	96	76,9— 92,2	84,09	0,26	13,38	3,51
4:3	Transverse frontoparietal index	96	61,2— 77,6	69,10	0,34	11,29	3,36
18:6	Morphological facial index	96	69,1— 93,7	80,86	0,51	24,91	4,99
8:6	Jugomandibular index	96	68,3— 83,5	76,10	0,33	10,79	3,28
13:21	Nasal index	96	49,1— 86,4	65,62	0,69	45,61	6,75

Table 3. Major parameters of the measurements and indices of the 41—60-year old males

No. of measurement	Jelleg	n	w	$\bar{x}$	m	s^2	s
1.	Maximum head length	185	170—201	186,10	0,48	42,69	6,53
3.	Maximum head breadth	185	141—172	157,44	0,40	29,79	5,45
4.	Minimum frontal breadth	185	89—122	108,02	0,37	26,04	5,10
6.	Bizygomatic breadth	185	129—159	142,95	0,40	29,49	5,43
8.	Mandibular angle breadth	185	94—129	111,95	0,41	31,47	5,60
13.	Nasal breadth	185	30— 47	36,56	0,23	9,67	3,11
15.	Head-ear height	185	111—149	129,63	0,45	37,57	6,14
18.	Morphological face height	185	102—138	120,13	0,48	42,76	6,53
21.	Nasal height	185	47— 62	53,51	0,23	10,23	3,19
45.	Horizontal head contour	185	519—600	558,57	1,13	237,14	15,39
1.	Body height	180	146,2—177,7	164,93	0,44	34,74	5,89
23.	Sitting height (trunk length)	184	75,5— 93,5	86,04	0,23	9,83	3,13
3:1	Cephalic index	185	76,4— 94,4	84,66	0,26	13,18	3,63
15:1	Height-length index	185	61,0— 78,7	70,13	0,23	10,05	3,16
15:3	Height-breadth index	185	73,9— 94,3	82,89	0,28	14,60	3,82
4:3	Transverse frontoparietal index	185	57,8— 75,9	68,71	0,24	10,34	3,21
18:6	Morphological facial index	185	71,0—100,8	84,14	0,37	26,14	5,11
8:6	Jugomandibular index	185	67,8— 87,7	78,29	0,24	11,13	3,33
13:21	Nasal index	185	55,6— 87,2	68,56	0,52	51,16	7,15

Table 4. Major parameters of the measurements and indices of the 41—40-year old females

No. of measurement	Character	n	w	$\bar{x}$	m	s^2	s
1.	Maximum head length	150	160—194	177,47	0,46	31,93	5,65
3.	Maximum head breadth	150	137—165	151,29	0,43	28,59	5,34
4.	Minimum frontal breadth	150	94—115	104,66	0,33	16,57	4,07
6.	Bizygomatic breadth	150	124—152	136,26	0,41	25,52	5,05
8.	Mandibular angle breadth	150	92—119	104,15	0,40	24,39	4,93
13.	Nasal breadth	150	27— 41	33,18	0,20	6,57	2,56
15.	Head-ear height	149	105—141	126,23	0,45	31,25	5,59
18.	Morphological face height	140	90—126	109,81	0,48	35,11	5,92
21.	Nasal height	150	40— 57	48,95	0,26	9,73	3,11
45.	Horizontal head contour	150	500—578	542,47	1,17	206,43	14,36
1.	Body height	147	140,9—165,7	152,56	0,43	27,22	5,21
23.	Sitting height (trunk length)	146	71,1— 90,0	81,67	0,28	11,57	3,40
3:1	Cephalic index	150	76,8— 93,9	85,30	0,26	10,12	3,18
15:1	Height-length index	149	63,4— 79,3	71,31	0,25	9,39	3,06
15:3	Height-breadth index	149	65,2— 92,9	83,48	0,32	15,35	3,91
4:3	Transverse frontoparietal index	150	63,1— 76,6	69,22	0,22	7,59	2,75
18:6	Morphological facial index	150	67,9— 95,4	80,78	0,39	22,52	4,74
8:6	Jugomandibular index	150	68,1— 83,6	76,37	0,26	10,17	3,18
13:21	Nasal index	150	54,9— 83,7	68,03	0,50	37,79	6,14

Table 5. Major parameters of the measurements and indices of the males over 61

No. of measurement	Character	n	w	$\bar{x}$	m	s^2	s
1.	Maximum head length	189	158—204	184,07	0,47	41,83	6,46
3.	Maximum head breadth	189	139—174	156,57	0,45	37,81	6,14
4.	Minimum frontal breadth	189	96—118	106,06	0,35	22,91	4,78
6.	Bizygomatic breadth	189	127—167	141,85	0,43	34,64	5,98
8.	Mandibular angle breadth	189	99—129	111,41	0,45	37,84	6,15
13.	Nasal breadth	189	31— 50	37,43	0,26	12,53	3,53
15.	Head-ear height	189	114—143	129,88	0,41	32,70	5,71
18.	Morphological face height	189	103—138	118,96	0,54	54,47	7,38
21.	Nasal height	189	47— 69	54,51	0,27	13,50	3,67
45.	Horizontal head contour	189	518—605	553,84	1,14	247,93	16,71
1.	Body height	172	146,7—176,7	161,47	0,48	40,39	6,37
23.	Sitting height (trunk length)	181	72,2— 93,2	83,52	0,27	13,19	3,63
3:1	Cephalic index	189	74,2— 97,5	85,13	0,26	14,23	3,77
15:1	Height-length index	189	63,4— 82,0	70,62	0,23	10,04	3,16
15:3	Height-breadth index	189	75,0— 97,2	83,05	0,26	12,74	3,56
4:3	Transverse frontoparietal index	189	60,0— 77,1	67,82	0,20	7,51	2,74
18:6	Morphological facial index	189	71,4— 95,5	83,63	0,38	27,35	5,22
8:6	Jugomandibular index	189	70,2— 89,0	78,57	0,27	10,03	3,74
13:21	Nasal index	189	54,7— 92,5	68,91	0,53	53,17	7,29

Table 6. Major parameters of the measurements and indices of the females over 61

No. of measurement	Character	n	w	$\bar{x}$	m	s^2	s
1.	Maximum head length	74	161—190	178,35	0,64	30,21	5,49
3.	Maximum head breadth	74	141—165	151,28	0,52	20,35	4,51
4.	Minimum frontal breadth	74	93—112	104,26	0,50	18,96	4,35
6.	Bizygomatic breadth	74	126—145	135,81	0,55	22,35	4,72
8.	Mandibular angle breadth	74	92—120	104,69	0,66	32,11	5,66
13.	Nasal breadth	74	27— 42	34,42	0,32	7,73	2,77
15.	Head-ear height	74	116—145	127,92	0,69	35,42	5,95
18.	Morphological face height	74	91—123	108,09	0,82	50,42	7,10
21.	Nasal height	74	44— 58	50,35	0,33	6,34	2,88
45.	Horizontal head contour	74	520—589	543,44	1,64	200,15	14,14
1.	Body height	72	13,57—159,5	149,14	0,63	29,05	5,38
23.	Sitting height (trunk length)	73	70,7— 85,7	78,81	0,45	14,66	3,82
3:1	Cephalic index	74	77,0— 93,3	84,92	0,36	9,80	3,13
15:1	Height-length index	74	64,2— 78,9	71,78	0,39	11,33	3,36
15:3	Height-breadth index	74	76,6— 95,4	84,68	0,45	15,46	3,92
4:3	Transverse frontoparietal index	74	62,8— 74,8	68,96	0,32	7,57	2,75
18:6	Morphological facial index	74	67,6— 91,6	79,94	0,62	28,36	5,32
8:6	Jugomandibular index	74	68,4— 86,3	77,05	0,41	12,63	3,55
13:21	Nasal index	74	56,0— 91,3	68,72	0,71	37,59	6,13

Table 7. Frequency of the major index groups. — Males

Index	Graduation	Denomination	24—60 years		Over 61		Total	
			n	%	n	%	n	%
Cephalic index	x—75,9	Dolichocephalic	—	—	1	0,5	1	0,2
	76,0—80,9	Mesocephalic	40	14,5	25	13,3	73	14,2
	81,0—85,4	Brachycephalic	121	44,0	73	38,8	221	42,9
	85,5—x	Hyperbrachycephalic	114	41,4	89	47,3	220	42,7
		Total:	275		188		515	
Height-length index	57,7—62,5	Orthocephalic	2	0,7	—	—	2	0,4
	62,6—x	Hypsicephalic	274	99,3	188	100,0	514	99,6
		Total:	276		188		516	
Height-breadth index	x—78,9	Tapeinocephalic	41	14,8	23	12,2	69	13,4
	79,0—84,9	Metriocephalic	153	55,4	112	59,6	296	57,4
	85,0—x	Acrocephalic	82	29,7	53	28,2	151	29,2
		Total:	276		188		516	
Morphological facial index	x—78,9	Hypereuryprosopic	37	13,4	29	15,4	78	15,1
	79,0—83,9	Euryprosopic	98	35,4	72	38,3	188	36,4
	84,0—87,9	Mesoprocopic	73	26,3	40	21,3	128	24,7
	88,0—92,9	Leptoprosopic	55	19,8	39	20,7	98	18,9
	93,0—x	Hyperleptoprosopic	14	5,0	8	4,3	25	4,8
		Total:	277		188		517	
Nasal index	x—54,9	Hyperleptorrhine	2	0,7	2	1,1	5	1,0
	55,0—69,9	Leptorrhine	169	61,0	106	56,4	307	59,4
	70,0—84,9	Mesorrhine	103	37,2	74	39,3	196	37,9
	85,0—99,9	Chamaerrhine	3	1,1	6	3,2	9	1,7
		Total:	27		188		517	

Table 8. Frequency of the major index groups. — Females

Index	Graduation	Denomination	24—60 years		Over 61		Total	
			n	%	n	%	n	%
Cephalic index	x—75,9	Dolichocephalic	1	0,4	—	—	1	0,3
	76,0—80,9	Mesocephalic	20	8,1	6	8,1	33	8,5
	81,0—85,4	Brachycephalic	110	44,7	35	47,3	175	45,3
	85,5—x	Hyperbrachycephalic	116	46,7	33	44,6	177	45,9
		Total:	246		74		386	
Height-length	62,6—x	Hypsicephalic	245	100,0	74	100,0	385	100,0
		Total:	245		74		385	
Height-breadth index	x—78,9	Tapeinocephalic	22	9,0	5	6,8	33	8,6
	79,0—84,9	Metriocephalic	136	55,5	34	45,9	213	55,3
	85,0—x	Acrocephalic	87	35,5	35	47,3	139	36,1
		Total:	245		74		385	
Morphological facial index	x—78,9	Hypereuryprosopic	86	34,9	32	43,2	141	36,5
	79,0—83,9	Euryprosopic	100	40,6	24	32,4	152	39,4
	84,0—87,9	Mesoprosopic	44	17,9	13	17,6	70	18,1
	88,0—92,9	Leptoprosopic	11	4,5	5	6,8	18	4,7
	93,0—x	Hyperleptoprosopic	5	2,0	—	—	5	1,3
		Total:	246		74		386	
Nasal index	x—54,9	Hyperleptorrhine	6	2,4	—	—	8	2,1
	55,0—69,9	Leptorrhine	158	64,2	45	60,8	251	65,0
	70,0—84,9	Mesorrhine	81	32,9	28	37,8	125	32,4
	85,0—99,9	Chamaerrhine	1	0,4	1	1,4	2	0,5
		Total:	246		74		386	

Table 9. Values of the sigma ratio of 24—60-years old males at Vésztő

No. of measurement	Character	S. R.
1.	Maximum head length	102,10
3.	Maximum head breadth	105,76
4.	Minimum frontal breadth	98,37
6.	Bizygomatic breadth	102,45
8.	Mandibular angle breadth	95,00
18.	Morphological face height	105,31
1.	Body height	104,13
		S.R. = 101,87
3:1	Cephalic index	103,23
18:6	Morphological facial index	103,52
		S.R. = 103,37

Table 10. Parameters of sexual dimorphism in the sample of Vésztő

No. of measurement	Character	d^2
1.	Maximum head length	5,62
3.	Maximum head breadth	4,33
4.	Minimum frontal breadth	2,69
6.	Bizygomatic breadth	5,20
8.	Mandibular angle breadth	13,39
13.	Nasal breadth	22,18
15.	Head-ear height	2,56
18.	Morphological face height	20,70
21.	Nasal height	15,92
45.	Horizontal head contour	2,50
1.	Body height	14,44
23.	Sitting height	6,97
		V_{sex} = 9,71
3:1	Cephalic index	0,08
15:1	Height-length index	0,59
15:3	Height-breadth index	0,34
4:3	Transverse frontoparietal index	0,13
18:6	Morphological facial index	4,93
8:6	Jugomandibular index	1,42
13:21	Nasal index	0,45
		V_{sex} = 1,13

Table 11. Result of taxonomic analysis in the sample of Vésztő

Races, sub-races		Males		Females		Totel	
		n	%	n	%	n	%
Brachycephals of dark complexion	Alpian (a)	69	15,5	71	24,1	140	18,9
	Armenoid (ar)	84	18,9	39	13,3	123	16,7
	Pamirian (p)	50	11,3	12	4,1	62	8,4
	Lappid (l)	5	1,1	30	10,2	35	4,7
	Dinaric (d)	11	2,5	4	1,4	15	2,0
	Undetermined brachycephalic (br)	63	14,2	29	9,9	92	12,5
	Total:	282	63,5	185	62,9	467	63,3
Cromagnoids	Cromagnoid—C (crC)	38	8,6	33	11,2	71	9,6
	Cromagnoid—B (crB)	28	6,3	29	9,9	57	7,7
	Cromagnoid—A (crA)	17	3,8	14	4,8	31	4,2
	Total:	83	18,7	76	25,8	159	21,5
Mediterraneans	Gracile Mediterranean (m)	46	10,4	11	3,7	57	7,7
	Atlanto-Mediterranean (am)	24	5,4	14	4,8	38	5,1
	Total:	70	15,8	25	8'5	95	12,9
Nordics (n)		8	1,8	3	1,0	11	1,5
Europids with Mongoloid features		1	0,2	5	1,7	6	0,8
	Total:	444		294		738	

Table 12. Major parameters of the 24—60-years old males in five different

No. of measurement	Character	Vésztő			Tápé			Orosháza			Dömsöd			Szakmár		
		n	$\bar{x}$	s^2	n	$\bar{x}$	s^2	n	$\bar{x}$	s^2	n	$\bar{x}$	s^2	n	$\bar{x}$	s^2
1.	Maximum head length	275	186,38	40,11	242	188,09	38,06	1017	187,17	42,97	221	186,15	39,89	231	185,58	34,60
3.	Maximum head breadth	275	157,81	30,30	242	157,61	28,09	1015	156,15	40,08	220	157,29	35,30	231	160,99	27,56
4.	Minimum frontal breadth	275	108,11	23,24	242	108,50	21,81	1012	109,35	29,04	219	110,59	23,26	231	112,02	20,18
6.	Bizygomatic breadth	276	142,72	27,39	242	144,25	33,18	1012	141,41	62,25	221	143,30	30,37	230	145,70	29,26
8.	Mandibular angle breadth	276	111,64	30,41	242	111,54	43,03	1019	110,46	44,73	221	112,98	44,88	231	112,08	33,17
18.	Morphological face height	276	120,52	45,48	242	120,19	46,38	1016	120,25	50,20	220	120,78	55,11	231	123,02	43,00
1.	Body height	268	165,91	36,49	241	166,85	38,56	1017	167,14	41,98	218	166,51	42,79	231	168,87	34,37
3:1	Cephalic index	274	84,69	12,37	242	83,91	11,02	1015	83,57	14,71	221	84,58	12,42	231	86,76	13,16
4:3	Transverse frontoparietal index	274	68,67	9,77	242	68,83	6,95	1011	70,07	14,57	219	70,41	10,39	—	—	—
18:6	Morphological facial index	276	84,48	27,89	242	83,47	26,83	1009	85,29	37,89	220	84,16	28,25	230	84,46	24,47

Table 13. Major parameters of the 24—60 years olf females in five different

No. of measurement	Character	Vésztő			Tápé			Orosháza			Dömsöd			Szakmár		
		n	$\bar{x}$	s^2	n	$\bar{x}$	s^2	n	$\bar{x}$	s^2	n	$\bar{x}$	s^2	n	$\bar{x}$	s^2
1.	Maximum head length	246	177,75	31,34	270	179,22	30,10	336	178,49	39,60	131	178,27	36,70	231	178,89	27,55
3.	Maximum head breadth	246	151,37	30,72	270	151,68	25,98	334	150,97	33,64	131	152,06	32,53	232	155,28	17,36
4.	Minimum frontal breadth	246	104,62	19,06	270	104,73	15,48	337	106,16	31,27	130	107,52	24,38	232	109,53	14,29
6.	Bizygomatic breadth	246	136,36	27,54	270	135,87	23,35	336	131,90	73,71	131	135,90	30,34	232	139,39	21,63
8.	Mandibular angle breadth	246	103,75	27,24	270	103,78	26,49	338	102,31	33,36	131	104,05	25,68	232	105,16	23,09
18.	Morphological face height	246	110,02	35,43	269	110,06	30,28	336	109,18	43,19	131	111,16	63,03	232	113,55	29,30
1.	Body height	242	153,76	30,66	269	154,35	33,41	336	155,98	33,18	130	154,30	41,79	232	157,65	25,44
3:1	Cephalic index	246	85,19	10,66	270	84,59	8,95	336	84,64	11,49	131	85,18	11,68	231	86,85	7,83
4:3	Transverse frontoparietal index	246	69,17	9,04	270	69,09	7,18	333	70,23	14,99	130	70,75	9,32	—	—	—
18:6	Morphological facial index	246	80,81	23,18	269	81,05	18,57	334	83,09	39,43	131	81,89	33,44	232	81,55	17,69

Table 14. Results of the F- and t-tests in the case of the four materials investigated. — Males

No. of measurement	Character	Vésztő—Szakmár		Vésztő—Tápé		Vésztő—Orosháza		Vésztő—Dömsöd	
		F	t	F	t	F	t	F	t
1.	Maximum head length	1,15	1,48	1,05	3,17	1,07	1,84	1,00	0,40
3.	Maximum head breadth	1,10	6,76	1,08	0,42	1,32	—	1,16	1,02
4.	Minimum frontal breadth	1,15	9,53	1,06	0,93	1,24	—	1,13	5,63
6.	Bizygomatic breadth	1,07	6,47	1,21	3,25	2,27	—	1,11	1,23
8.	Mandibular angle breadth	1,09	0,88	1,41	—	1,47	—	1,47	—
18.	Morphological face height	1,05	4,23	1,01	0,55	1,10	0,57	1,21	0,41
1.	Body height	1,06	5,58	1,05	1,74	1,15	2,86	1,17	1,05
3:1	Cephalic index	1,06	6,90	1,12	2,60	1,19	4,66	1,00	0,37
4:3	Transverse frontoparietal index	—	—	1,40	—	1,49	—	1,06	6,21
18:6	Morphological facial index	1,14	0,04	1,04	2,24	1,36	—	1,01	0,68

Table 15. Results of the F- and t-tests in the case of the four materials investigated. — Females

No. of measurement	Character	Vésztő—Szakmár		Vésztő—Tápé		Vésztő—Orosháza		Vésztő—Dömsöd	
		F	t	F	t	F	t	F	t
1.	Maximum head length	1,13	2,28	1,04	3,06	1,26	1,48	1,17	0,84
3.	Maximum head breadth	1,77	—	1,18	0,67	1,09	0,87	1,06	1,15
4.	Minimum frontal breadth	1,33	—	1,23	0,30	1,64	—	1,27	5,80
6.	Bizygomatic breadth	1,27	—	1,17	1,11	2,67	—	1,10	0,81
8.	Mandibular angle breadth	1,18	3,13	1,03	0,07	1,22	3,13	1,06	0,54
18.	Morphological face height	1,21	6,92	1,17	0,80	1,21	1,61	1,77	—
1.	Body height	1,20	8,10	1,09	1,18	1,08	4,72	1,36	—
3:1	Cephalic index	1,36	—	1,19	2,14	1,08	1,96	1,09	0,02
4:3	Transverse frontoparietal index	—	—	1,25	—	1,66	—	1,03	4,78
18:6	Morphological facial index	1,31	—	1,24	0,40	1,70	—	1,44	—

Anthropological features og the persons in thfl photograph Plates

Fig. No.	Sign of picture	Age (year)	Sex	Body height	Cephalic index	Face	Original hair colour	Colour of eyes	Anthropological classification
1.	a	31	male	161,0	85,3	bread	blackbrown	brown	Alpine
	b	36	female	152,4	89,1	very broad	blackbrown	light brown	Alpine + other
2.	a	68	male	—	85,1	medium-broad	brown	green	Armenoid
	b	41	male	159,4	85,1	medium-broad	black	light blue	Armenoid
	c	63	female	149,1	90,9	broad	fair	blue	Armenoid
3.	a	42	male	170,8	85,9	broad	black	dark blue	Pamirian + other
	b	31	female	164,3	84,1	medium-broad	blackbrown	brown	Pamirian + other
4.	a	68	male	157.4	87,8	broad	blackbrown	green	Lappid
	b	41	female	152,3	82,8	very broad	black	blue	Lappid
5.		40	male	168,5	84,9	medium-broad	blackbrown	dark blue	Dinaric
6.		40	male	166,5	84,3	very broad	blackbrown	green	Cromagnoid—C
7.		43	female	158,0	87,5	very broad	blackbrown	grey	Cromagnoid—B + other
8.		35	male	177,0	85,1	broad	brown	dark blue	Cromagnoid—A
9.	a	51	male	156,7	79,9	narrow	blackbrown	brown	gracile Mediterranean
	b	30	female	162,3	81,0	medium-broad	brown	brown	Atlanto-Mediterranean
10.	a	28	female	160,7	83,0	very broad	blackbrown	dark blue	Cromagnoid—C + Mongoloid (Uralian)
	b	50	female	156,5	85,6	very broad	black	dark blue	Turanid + Cromagnoid—C